

Preparation and use of in-situ-modified nanoparticles

Abstract

The present invention relates to a process for synthesizing nanoparticles, in particular metal salt nanoparticles, and, in particular, to the chemical modification of their surfaces.

The invention proposes adding, to the synthesis mixture, a modifying reagent which binds, by means of a first functional group, to the nanoparticle surface and which carries a second functional group for binding to molecules which are specifically selected in dependence on the subsequent use of the nanoparticles. This consequently dispense with a postsynthetic, separate, application-specific modification step. Advantageously, it is possible to provide a third functional group. A new substance class, the pentaalkyl iminobis(methylenephosphono)carboxylates, are particularly suitable for this purpose. The particular achievement of these modifying reagents is, especially, that they permit the nanoparticles to grow in a specifically controlled manner and, at the same time, modify the surface of the growing nanoparticles, (in-situ) during the synthesis, such that the particles can be very readily dissolved in a large number of solvents and carry functional groups for coupling on molecules, resulting in the particles having, immediately after having been synthesized, a certain all-round usability.

(Fig. 1)